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ABSTRACT

The development of interactive video materials for developing listening comprehension in beginning learners of Hebrew as a second language is described. Initially, videotapes presenting stories in the form of interviews set in Israel were designed and produced according to current instructional design theory. These were viewed by the prospective audience, university students in the United States. After seeing the tapes, the students studied their notes for a few minutes and were asked to write as much as they could remember of the tapes, in English, with the assistance of brief intermittent exposure to some of the tapes' visuals. A week later the same process was repeated, and the students were interviewed and quizzed. Statistical analysis of these results and the students' overall grade point averages revealed the most effective and needed program components, which were then built into an interactive program to accompany the tapes. Results of the use of the interactive program were obtained and compared to the previous results. The interactive treatments seemed to facilitate recall of both story and details for the learners who acquired the necessary Hebrew vocabulary; they seemed to facilitate success for students with moderate grade point averages as long as they had a fair amount of Hebrew vocabulary. Six pages of references are appended. (MSE)

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Interactive Video:
A Tool for Developing Listening Comprehension in Second-Language Learners

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Presented at the Annual Meeting of the American Educational Research Association

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April, 1986

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Abstract

Knowledge from fields such as reading, discourse processing, and cognitive strategies was used as a theoretical basis to design a prototype material for listening comprehension in a second language for novice second language learners. The formative developmental study design was administered in several stages: first, generic materials were designed and produced (videotapes); second, they were used with prospective clientele in the natural setting; third, results were analyzed; fourth, hypothesized missing components (study skills from text) were built into an interactive program which used the original videotapes; fifth, results of the use of the interactive programs were obtained and compared to previous results. The interactive treatments seemed to facilitate recall of both gist and details for the learners who acquired the necessary second language vocabulary and to facilitate success for students with moderate grade point averages as long as they had a fair amount of second language vocabulary.

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I. INTRODUCTION

1. The Problem

1.1 The Instructional Design Perspective

The recent phenomenon of availability of interactive video systems (tape or disc) is creating hopes among people involved in education. The phrases sound very promising: "The intelligent, interactive videodisc system does indeed offer opportunities for both instructor and learner unparalleled in history (DeBlois, 1982, p. 28). However, even DeBlois admits "a lack of adequate theory base supporting the discipline of instructional technology" (p. 29).

Reigeluth (1983), who surveys the important theoretical models of instructional design concludes that "there is a great need for a knowledge base to guide instructional developers and instructors. . . But this promising discipline is still far from being able to prescribe optimal methods for all goals and conditions" (p. 473). Reigeluth views instruction using a house metaphor, which includes many rooms--different types of objectives. Therefore "a priority for all instructional scientists should be: . . .to talk in terms of describing individual rooms instead of claiming to be describing the whole house" (p. 474). It seems that in order to create a fruitful advancement in instructional design each researcher should be explicitly involved in one type of instructional task. This would probably help create instructional design models for different types of tasks that will subsequently promote theory construction.

A similar conclusion is reached by Richard Clark (1983) after a research review. He argues that most current summaries and analyses of media

comparison studies suggest that "media do not influence learning under any conditions" (p. 445). He prefers to call media vehicles to deliver instruction. He concludes in recommending that future research concentrate on "necessary characteristics of instructional methods and other variables (task, learner aptitude, and attributions) which are more fruitful sources for understanding achievement increases" (p. 457).

Lesgold (1983) calls for prototype research to realize the potential of intelligent instructional systems. Lesgold explains that theoretical ideas developed in the laboratory are not certain to work in practice: "To be useful, prototype research must be carried out to reflect and test explicitly theoretical ideas about instruction. This will allow us to discover why proposed methods work (or why they do not) and to lay the groundwork for further scientific inquiry" (p. 21).

To summarize, it seems plausible when utilizing media to look for instructional methods that, according to basic research, are effective, and implement them in prototype materials aimed at facilitating certain learning tasks for a target population of learners. The research results would provide knowledge if the principles applied are working in the target conditions. This knowledge is important for instructional design to guide further developments. On the other hand treatments designed for certain learning tasks will enhance our understanding about the tasks themselves for people who are interested in basic research.

1.2 The Foreign Language Perspective

Foreign language (FL) learning is a traditional school subject matter. In a few societies (as in Canada) the concensus has been that bilingual education is a basic skill that provides "communicative proficiency. . . to function and

succeed" (Genesee, 1985, p. 541) and therefore a second language program has been established early in the elementary grades, as the immersion programs. In other societies a second language is introduced in high schools and colleges, where curriculum decisions are based on the notions of advancement in international understanding and/or exchanging scientific knowledge among countries.

Whatever the reasons of planners in higher education institutions, a survey conducted in Iowa revealed that 87% of the students taking a foreign language did so primarily to satisfy a requirement. In non-requirement situations well over 50% of students who begin foreign language study on the college level do not continue into the second year of such study (Benseler et al., 1980). According to an ADFL survey the modern foreign language "share" of the total U.S. college enrollment was 15.5% in 1968 and 8.4% in 1980 (Woloshin, 1983). In the U.S. most FL programs start at a late age (high school or college) and the general situation in the undergraduate program is declining in morale and in number.

There are several methods that have been developed for foreign language teaching: the audiolingual method, the cognitive method, the direct method and the grammar translation method, but none has achieved a concensus of support as "the one true way" to teach a foreign language (Omaggio, 1983).

Several other methodologies are being practiced or experimented with. Among them are the Confluent Approach, Community Language Learning or the Counseling-Learning, the Silent Method, Suggestology, the Total Physical Response Method, etc. (Benseler et al.,1980). Benseler explains why the last group of methods was not largely adopted. "Most research studies utilizing these approaches have been conducted with specialized groups of students (e.g., highly motivated adult language learners) or under special instructional

constraints (e.g., intensive exposure), and findings cannot be conclusively generalized to traditional college instruction designed for heterogeneous groups of students" (p. 90).

Woloshin (1983) blames foreign language departments, who in "their self-perpetuating zeal and their need to accomodate a reactionary reward system, seek primarily to train literary researchers. . . . Too many undergraduate foreign language students are being taught by untrained, uncommitted, poorly rewarded, and often completely unsupervised teachers" (p. 358). It seems that training literary researchers is satisfying the goals of a minority of students while the majority of students have neither a well focused program nor the best teaching staff.

One of the directions of FL undergraduate instruction is toward technological solutions to enhance the attractivity of the under-graduate FL programs and to sustain good instruction for these programs. Within the FL field are some proponents of technological solutions who can see many instructional potentials in the technology: "If the past decade has allowed us to dream of things to come, facilitated by a technological revolution that many teachers still cannot quite understand, the coming decade will allow us to watch many of our dreams come true" (Meredith, 1983, p. 424).

On the other hand the same people know that FL educators are suspicious of technological miracles because of the widely admitted failure of the language laboratories (McCoy & Weible, 1983).

An analysis of past experience with the language laboratory reveals that there was "a simplistic faith in the power of technology to overcome all problems" that led to a rapid and extremely widespread adoption of language laboratories (McCoy et al., 1983, p. 132). Administrators were putting pressure on for using the labs, but two critical factors had been omitted from

the equation: teacher involvement and courseware. McCoy and Weible (1983) evaluate that the courseware material was "boring repetition coupled with a total lack of student interaction with the material" (p. 132).

In general there is a widespread use of audiovisual materials in the foreign language classroom, but as Meredith (1983) asserts, "Little empirical research has been conducted on the effectiveness of such usage" (p. 424). Most of the literature in FL teaching regarding media is testimonial: reports of successful applications of various types of media. Meredith points to two studies, one by Omaggio and one by Mueller, that should be models because they are investigating a certain specific question. Omaggio (1979) tried to determine the effectiveness of varying types of pictorial cues. This kind of information guides not only development of sophisticated technological solutions, but also simple "aids" in classroom practice.

The testimonial research is not particularly helpful because the general scenario of such research is an account of a specific case of a videotaped segment in order to provide "an opportunity to review the spoken material and to build one's confidence for comprehending the unremitting voice of the speaker" (Helbig, 1977, p. 7), but there is no rationale behind the choice of the specific text or visuals. Only a list of suggested exercises on how to follow up the video treatment is provided.

What is needed is:

A. a much more detailed description of variables, incorporated into a treatment;

B. a general theoretical rationale behind the employment of these variables;

C. a description of the learners, in addition to their performance, would be helpful: what kind of curriculum and

instructional method did they experience in FL and for how long.

To summarize, in order to produce good materials for FL learning, prototypes should be developed that will incorporate principles from various fields of knowledge. Then their effectiveness and their appeal should be measured in the natural settings and with samples of their prospective clientele. Results from experiments with such prototype materials could promote knowledge of instructional design for FL materials and of the process of second language learning.

2. The Learning Task: Listening Comprehension

2.1 The Change of Importance of Receptive Skills in FL Education

During several decades audiolingualism and afterwards communicative methods were dominant in FL education. These approaches emphasize productive skills, but recently the FL field is reevaluating the receptive skills' importance. Some say that, "The receptive skills are the primary path to language mastery, and that language learning should therefore initially concentrate on active comprehension, leaving the systematic training of the productive skills to a later stage" (Davies, 1983, p. 245). Davies puts his finger on the terminology that reflects a change in theory. "Receptive" used to be a second word for "passive", and therefore receptive skills were neglected. Now some would rather use "interpretive" skills (Mooijman, 1983) to emphasize the active role students are called upon to play while listening or reading. But even with no change of terminology listening comprehension has only recently been conceptualized as "a highly complex problem-solving activity" (Byrnes, 1984, p. 318).

2.2 "How To" Listening Comprehension in FL Education

Some specialized methods in FL teaching, such as the Total Physical Response (see section 1.2) concentrate on listening as the major skill in the first period of instruction. These methods were classified by Gary (1978) as (1) pictorial-audio match, (2) physical response audio match, and (3) graphic-audio match. In all three, the principles are similar: use of all the instructional time for listening only; start with short segments (a word or a command) and increase complexity; elicit immediate response; and for every step, provide immediate feedback. But Gary does not provide any description of the sequencing rationale of all or one of these methods: what aspect of language is introduced first as far as content and as far as forms. She summarizes the assumptions underlying the methods reviewed "a delayed speaking approach":

> "1. Language is not speech. It is a set of principles establishing correlations between meaning and sound sequences or other overt forms of communicative language such as sign language.
>
> 2. Learning a first or second language does not occur through habit formation. Rather, it occurs by an inductive-deductive process whereby the learner starts with a general theory of grammar, and given the linguistic data of a particular language, constructs a grammar for the language based on this theory.
>
> 3. The development of receptive skills is necessary for the development of productive skills. That is, speaking is a result, not a cause of language learning, and therefore should be postponed, at least in the early stages of language learning.
>
> 4. Effective listening comprehension training must be meaningful, challenging, require overt learner response, and provide immediate feedback to the learner as to the correctness of his response" (p. 192).

It seems that only the words "meaningful" and "challenging" are descriptors to the kind of language used for listening comprehension, which is not much help in designing instruction or instructional materials for listening comprehension.

However, most undergraduate classroom FL instruction is not using one of the methods of concentration on listening comprehension only, but one of the more common methods (see section 1.2). The mainstream of second language pedagogy (Omaggio, 1984) has lately accepted that "comprehension generally precedes production in language acquisition. Students can typically understand material that is more advanced than material they can consistently and accurately produce" (p. 55). Regarding instructional materials Omaggio (1983) recommends the two kinds of language: authentic and simplified.

The pull for authenticity stems from the communicative approach to language learning. Therefore real or simulated cultural items are recommended: travel documents, menus, newspapers, radio broadcasts, television or film, etc. But Omaggio (1983) admits that there is a problem with authentic language materials when dealing with novices: "Just how to make the most effective use of authentic language materials in elementary-level classes remains unclear" (p. 334).

A major theoretical influence on FL education field is maintained by Krashen (1984) who is famous for his input hypothesis. Krashen theorizes that people acquire language that is directed at the acquirer's current level of competence, but which includes some structures that are somewhat beyond that level as well. He asserts that language learners will understand that which is "beyond" them from contextual cues in the message or from

extra-linguistic cues. Krashen's influence on FL education thinking is in the direction of simplified language which is just slightly beyond the learner. Krashen recommends an increase in complexity as the learner progresses.

The two trends of authentic language and simplified language are pulling in opposite directions. Omaggio (1983) tries to find a compromise in three ways:

> "[A.] Using simplified version of authentic materials in elementary and intermediate instruction and gradually moving toward incorporating complete, unedited language samples in advanced courses.
>
> [B.] Provide enough extralinguistic cues to render unedited authentic materials 'comprehensible' to the beginning or intermediate student
>
> [C.] We should not, however, abandon the use of materials created for instructional purposes in favor of 'authentic' materials alone. Rather a blend of the two seems more appropriate" (p. 334).

It seems clear that with all the intentions of providing authenticity--"Language as used in the target culture" (Omaggio,1983)--some simplification is needed for novices. Otherwise, why would adults living in a foreign country for many years, exposed to all its authenticity, not achieve proficiency in the target language? The first two suggestions by Omaggio could give general guidelines if one wants to design an "authentic" material for novices, but it is not specific enough.

The definition of authenticity is not simple (Davies, 1984), and one can find authenticity in one, some, or all of the following aspects: setting, characters, topic discussed, attitudes/views expressed, vocabulary used, syntax employed, pronunciation, intonation, gestures, speed of production and reaction, clarity and distinctness of word production, and more.

Only very recently do we see direct influence from developments in

psychology and in reading on the FL field. Byrnes (1984) disputes old notions of listening comprehension and proposes a model of three interacting variables: raw data, contextual understanding, and schema-based understanding. In her words, "It would be too simplistic to conceive of it as serial processing of linguistic form categories, no matter how elaborated these may be. Rather, cognitive processing will have to involve schema-based understanding as well as contextual understanding in addition to the raw input data. 'Schema-based understanding' draws on information stored in long-term memory as frames or scripts which direct the comprehension process, while 'contextual understanding' by providing further input, helps the listener resolve ambiguities and uncertainties to form hypotheses and draw inferences. . . Listening comprehension, conceived in this way, forces us to go far beyond a mechanistic view of language, which has far-reaching implications for language teaching" (p. 319).

Byrnes's (1984) contribution is not only to the psychological parameters of listening comprehension, but also to the classification of the different discourse types in oral language which is "a subset of the totality of language use" (p. 319). The following four oral discourse types are mentioned:

> "1. Spontaneous free speech, characterized by the interactiveness of the situation (i.e., initiating turn-taking, leave-taking strategies, overlapping speech, checking the channel, repairing possible lapses in the partner's comprehension) and by constraints on the speaker's manner of speech production, which bring on poor ordering, discontinuous, fragmented syntax, rephrasing, different lexical choices, etc.;
>
> 2. Deliberate free speech as it occurs in interviews and discussions, which has higher information value but maintains some of the interactional and production-related characteristics of spontaneous speech;
>
> 3. Oral presentation of a written text as in newscasts,

> commentaries, and lectures, where transmission of information is the objective, and interactional considerations enter on a much more covert level;
>
> 4. Oral presentation of a fixed, rehearsed script such as on stage or in a film. This will bring about highly stylized forms of delivery which reflect aesthetic and artistic valuations above and beyond the message itself" (p. 319).

These developments are very encouraging, but still one should conceptualize a rationale, according to program objectives and entering state of students, for using one or more of the discourse types just described, to practice listening comprehension. One should be aware, too, that many variables could be involved in comprehension of each discourse type, as described above regarding authenticity (in this section).

2.3 Comprehension

Comprehension of connected discourse is now studied in many fields. In most cases it was done with expository prose in first language, English (Meyer, 1981) or with stories that adhere to the western story schema (Mandler, 1978), again in English. In these studies sometimes the subjects were exposed to the discourse through listening (Meyer & McConkie, 1973) and sometimes through reading (Meyer et al., 1978). Basically, it looks as though people in the field accepted Kintsch and Van Dijk's (1978) position:

> "Comprehension is involved in reading as well as in listening, and our model applies to both. Indeed, the main differences between reading and listening occur at levels lower than the ones we are concerned with... We are talking here, of course, about readers for whom the decoding process has become automated, but the model also has implications for readers who still must devote substantial resources to decoding" (p. 364).

Actually, in practice the connection between reading and listening has long been believed in the reading field (Sticht & James, 1984), and oracy to literacy transfer has been the rationale for intervention programs to develop verbal (oral) skills of preschool children to facilitate their success in reading when they reach school.

When looking at research on television viewing, Collins & Wiens (1983) say, "In a broader persepctive, comprehension of television content demands many skills that are similar to those required for literacy more traditionally defined" (p. 197). Consequently, one could adopt Rumelhart's (1980) position of what comprehension is: "Readers are said to have understood the text when they are able to find a configuration of hypotheses (schemata) that offers a coherent account for the various aspects of the text. To the degree to which a particular reader fails to find such a configuration, the text will appear disjointed and incomprehensible" (p. 38). It seems that the notion of text would generalize to any other connected discourse.

3. Study Design

It seemed as though that knowledge from fields such as reading, discourse processing, and cognitive strategies for comprehension could contribute most as a theoretical basis for design of a prototype material for listening in a second language. The prototype was designed in the following stages:

A. The generic material was planned to be a videotape in order to provide visual extralinguistic support and to allow various pacing according to student level. Visual support has been shown to facilitate comprehension in FL education studies (Omaggio, 1979; Mueller, 1980).

The design of the videotape was carefully constructed according to recommendations of research on how to construct materials for reading (Pressley, 1983); more details will be provided ahead.

In order to avoid claims of special experimental effects two videotapes were produced with two different "stories".

B. The two videotapes were tested on one intact classroom of a Hebrew 102 class at the Ohio State University. The students wrote recall protocols after listening to each tape on a different week. After the two listening experiences, the students were interviewed.

C. Results were analyzed, and according to weak points found a new component was built into the system. The two computer programs made each videotape interactive and included variables that were hypothesized to increase comprehension without providing vocabulary or story translations.

D. The next quarter the interactive videotape was tested at the same period of the quarter (the eighth and nineth week) on a same level intact classroom. This group of students was interviewed also.

E. Results of the two groups' performances were plotted on graphs to see if there is a general direction typical to each group which might be due to treatment differences. Correlations were computed, and statistical tests were conducted.

F. The interviews were analyzed to find what students appreciated as helping or debilitating in treatments they experienced and in other treatments proposed as alternatives by the experimenter.

II. THEORETICAL FRAMEWORK AND IMPLEMENTATION

1. Theoretical Framework for the Design of the Generic Materials

As stated in section 2.3 of chapter I it was hypothesized that research and theory from the reading field could provide a theoretical framework for designing the material. Four variables were deliberately implemented in the treatment: content, structure, signaling, and pictures. The theoretical framework for each one follows.

1.1. Content

Chall (1983) has provided a stage analysis of the acquisition of reading skills. During the early stages of reading, the reading task is largely that of symbol decoding and bringing meaning to the printed page. This is what is called the "learning to read" stage. Young readers are given stereotypical stories. Also, pictures are provided to illustrate events in the text. The goal of reading at this stage is to confirm what is already known. Readers are seldom asked to retain the materials they read for an information value. At a certain point there is a shift in the reading process. Readers begin to read to gain new knowledge and information, which is the "read to learn" stage. Prose with highly familiar concepts is now replaced by text information that is largely unfamiliar to the reader. The implication too is that the materials read are now to be retained for an information value in their own right.

In the typical undergraduate FL classroom the students are very heterogeneous, and using the constructs of Chall each one is at a different stage in the continuum of from "learning to listen" to "listening to learn". Therefore the content that was chosen for the listening practice material

was new in the respect that it was from the lifestyle of the target linguistic community (Israel) but it was highly stereotypical as will be described ahead.

Choosing content from the lifestyle of the target linguistic community is based in the growing awareness of researchers who study comprehension for the need of content knowledge or "world" knowledge in order to comprehend text. Collins & Wiens (1983) propose a model of three categories that may affect comprehension of television programs: "(1) knowledge about presentation formats (e.g., the structure of stories, commercials); (2) knowledge of media conventions (e.g., formal features, cinematic conventions); and (3) general social or 'world' knowledge" (p. 183). Cook and Mayer (1983) put content knowledge in their model, too: "A cognitive theory of learning from prose assumes that a reader comes to the reading task with a vast storehouse of existing knowledge. The storehouse includes content, structural, and process knowledge" (p. 93). Bernhardt (1984) who has done research in FL reading, calls for designing materials, which will provide "historical, economic, and visual information in order to approach. . . text with adequate memories for comprehending the passages" (p. 24-25).

From another perspective, content or world knowledge about the target linguistic community is important. There is a growing awareness among FL educators that in addition to reading, writing, speaking and listening, culture is a fifth necessary skill (Hiple, 1982). One aspect of teaching culture of the target linguistic community to second language learners is to provide the necessary content knowledge that is so needed to be able to comprehend oral as well as written messages.

To summarize, providing "stories" from the lifestyle of the target linguistic community is not only to make it interesting and motivational to the learners, but it is a necessary input in reading or listening practice. The

learners should practice decoding but at the same time they can little by little study content that will in turn prepare them to comprehend more in subsequent encounters with second-language oral or written discourse.

1.2 Structure

In the comprehension models cited in section 1.1 in this chapter, in addition to importance of the content aspect a structure aspect is agreed upon. Collins and Wiens (1983) talk about two aspects of structure: the structure of the stories themselves and media conventions of presenting them. Cook and Mayer (1983) review several approaches to structure. There are story grammar theories regarding narratives (Mandler and others); there is a structural analysis regarding expositiory prose (Meyer, 1975), and some work done on content domain, such as structures commonly found in science textbooks.

Cook and Mayer (1983) report on a study of training to identify three text structures (generalization, enumeration and sequence). Using an unfamiliar biology passage the trained students outperformed a nontrained group on both recall and problem-solving tests.

Meyer's (1975) results of people remembering information mainly from the top-level structure of prose and Mandler's (1978) results of people using story schema in retrieval are additional support to the notion that discourse with a recognizable macrostructure (Van Dijk, 1977) is easier to comprehend and remember.

1.3 Signaling

Signaling is defined by Meyer (1981) as the following: "Signaling can be described as information in the text that does not add new content to a topic,

but gives emphasis to certain aspects of the semantic content or points out aspects of the structure of the content" (p. 19).

Meyer's (1981) review of the signaling effect ties it to text type and student skill level. When a text has "differential emphasis", (some elements are more emphasized than others, which does not match the "real" content structure) then signaling improves performance of high and moderate achievement students. Also, when a text has "normal emphasis" (as compared to the content structure), signaling improves performance of moderate achievement students but does not contribute much to performance of high achievement students. In the case of high achieving students there was "found only a trend for facilitation that was not statistically significant (p. 19). Poor readers may lack sensitivity to its usefulness.

Franks et al (1982) found a strong effect of the nature of materials on students' ability to learn. These researchers differentiate between "explicit text" and "implicit text". The description of the difference between these two kinds of text is similar to text having signaling versus text without signaling: "The explicit passage provided elaborations that made the information less arbitrary. . . . an implicit passage (no elaborations were provided in the text)" (p. 414).

1.4 Pictures

Several researchers have followed the question of the function of pictures in learning. Simple answers were not provided, but researchers have developed a classification of different kinds and functions of pictures, and within this more detailed framework several answers were provided.

Winn et al. (1985) classifies graphics to three major functions: illustration, cuing, and structuring. According to this classification system

the picures used in the generic material were for the purpose of illustration. Winn et al. (1985) define this function as follows: "When graphics are used to illustrate something, it is their purpose to show as accurately as possible what something looks like" (p. 6).

Levin (1981) presented a classification system of eight functions of pictures. The classification is reproduced here (p. 212):

Table 1. Proposed Functions of Prose Pictures (adapted from Levin, 1981)

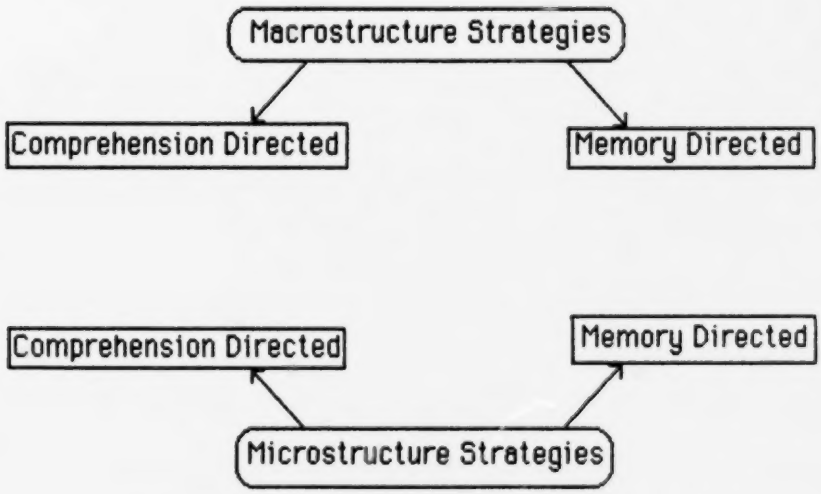
Function	Anticipated Contribution to Improved Prose Learning
1. Decoration	Not applicable
2. Remuneration	Not applicable
3. Motivation	Little or none
4. Reiteration	Little
5. Representation	Moderate
6. Organization	Moderate to substantial
7. Interpretation	Moderate to substantial
8. Transformation	Substantial

Within this classification system, the pictures used in the generic material had the functions of reiteration, representation and interpretation. The hypothesis was that pictures will function differently for students of various levels. They will be more essential for students with low to moderate

achievement in the second language, and for them, the pictures will carry the function of interpretation. For students with moderate to high achievements in the language but who have not been in the target country (Israel), the pictures will carry the function of representation. For a small group of students who have been in the target country the pictures will carry the function of reiteration.

Levin (1982) provides a framework that classifies strategies which are assumed to contribute either to recall or comprehension of macrostructure or of microstructure.

Figure 1. Prose-Learning Strategies (adapted from Levin, 1982, p. 414)



Pictures are mentioned in this system as enhancing memory of microstructure, and also "pictorial concretization" could enhance comprehension of macrostructure (p. 415). In the generic material (videotapes) pictures of places and people were used that represented/ illustrated/made more memorable details of the stories. In addition, the general framework was an interview, so most of the time the students

viewed the two people talking in the studio (a general concrete framework), but from time to time pictures of concrete details were interspersed. More on the description of the materials will be elaborated in section 1.5 of this chapter.

1.5 Description of the Generic Materials

Content. Two interview scripts were written. The variables incorporated into the scripts are described below, followed by specific examples from the stories.

The objective of the program was to provide to the students facts about the lifestyle of the target linguistic community as related to two different locations in the country: a historic city which has a large university (Jerusalem) and a resort city (Eilat). The facts were intended to be remembered not only in abstract, but also tied to more concrete (visual) experiences of how the places and people look. In order to make the facts more comprehensible and more memorable the two "stories" were structured as will be outlined below. Also, in order to strengthen the concreteness aspect and to create more learner involvement in the stories, some parts of the stories were unfolded around a human model, mainly the interviewee, but sometimes the interviewer also "remembered" that she was involved in similar events. The importance of human modeling to attitude learning is discussed in Gagné, (1977).

Story Structure The aspect of story structure could be divided into two constructs: "dynamic" structure and "static" structure. These constructs are sometimes used in the literary theory field. The "dynamic" structure is created through the sequence of the story while the "static" structure is created from all the elements in the story, regardless of sequence, and could be appreciated only after reading or listening to the whole story.

be appreciated only after reading or listening to the whole story.

The Dynamic Structure. The dynamic structure or sequence of the two stories follows a similar pattern: The interviewer greets the interviewee and announces the topic: HAYOM ANI ROTZA LEDABER AL YERUSHALAIM (Today I would like to speak about Jerusalem). Next, two more elements follow, not always in the same sequence: a general statement about the place, and the interviewee's relationship with this place to establish the credibility of her expertise. In one story the general statement is: YERUSHALAIM MEOD YAFA UMEOD ME'ANYENET. YESH DEVARIM XADASHIM UMODERNIYIM VEYESH DEVARIM ATIKIM VEYESHANIM (Jerusalem is very beautiful and very interesting. There are new and modern things, and there are old and ancient things.) In the second story the general statement is a combination of question and answer: LAMA ANASHIM NOS'IM LE EILAT? KI ZE MAKOM LA'ASOT XAIM BE'IKAR BIGLALL HAYAM (Why do people go to Eilat? Because this is a place to enjoy oneself, mainly because of the sea.) In the story about Jerusalem the interviewee reveals that she knows the city since she has been a student there for five years. In the story about Eilat both the interviewer and interviewee have been there and they both tell how they arrived (means of transportation) and the activities in which they were involved.

The rest of the story is being unfolded through questions and answers which follow a certain general outline. In the story about Jerusalem the general outline is around a typical week of a student with most of the information provided about the social life of the students. Sometimes the interviewee is talking in a general manner: BEYAMIM REGILIM: HOLXIM LEKURSIM, LOMDIM BASIFRIA VEGAM OVDIM (Usually people go to courses, study at the library and also work). Sometimes she talks in a general manner,

but specifically includes herself as experiencing the event: HARBE PEAMIM HAYNU KONIM FALAFEL VEHOLXIM BAREXOV IM AFALAFEL BAYAD (Many times we used to buy falafel and go on the street with the falafel in hand). And in a few cases she talks about her experience as different from that of other students; i.e., she did not have a family in Jerusalem, but she had very good friends.

The expected advantages of the structure just described are structure on the one hand and variety on the other hand. For instance, the activities in the Jerusalem story are organized around days of the week and even certain parts of each day, such as: boys are going to watch soccer on Saturday afternoon. However, variety is achieved by the relationship of Batia's (interviewee name) plot to the main plot. The expected disadvantage could be that the existence of two plots (Batia's plot and most students' plot) will create a burden on the learners who may exhibit task overload.

At the end of the interview, the interviewee is prompted to summarize her experience with a general statement. In the story about Jerusalem a question and an answer serve this purpose: AZ MAHI YERUSHALAIM? IR MODERNIT O ATIKA? (So what is Jerusalem? A modern city or an ancient city?) GAM ZE VEGAM ZE. YESH BA GAM YASHAN VEGAM XADASH (Both. There is in it both old and new). In the story about Eilat again the last question and answer are dedicated for a summary statement. Question: AZ MA ZE EILAT? MA ME'ANYEN SHAM? HATEVA? (So what is Eilat? What's interesting there? The nature?) Answer: GAM HATEVA VEGAM HA'ANASHIM. . . KOL. . . HAKOL SHONE HAKOL MEYUXAD BEEILAT (Both the nature and the people. . .all. . .everything is different, everything is special in Eilat).

The Static Structure. As for the static structure or "content structure"

(Meyers, 1975), I would argue that it is not as simple to obtain, as it is in expository prose.

A nice framework to the different genres of oral language is provided by Byrnes (1984). Byrnes differentiates between four types of oral language which are subsets of the totality of language use and are also typically occurring under different circumstances (see section 2.2 in Chapter I).

The language produced in the videotapes could be mainly classified as type 2 in Byrnes's framework. There was an informational aspect intended for the students to learn but it was also interactional. There was some aspect of type 4, too: The stories were written to be well structured so elements in the stories were highly interrelated to facilitate recall. But since the genre was an interview with an authentic "expert" from the target linguistic community, then this aspect was not expected to be highly salient in the students' interpretation. In the story about Jerusalem the underlying theme was the combination of old and new in one city. This idea was expressed in the opening and closing generalization but was also in the description of the two parts of the city (old and new) and in the students' social life (a traditional family meal on the one hand and a disco on the other hand). In the story about Eilat the underlying theme was that this resort city is a special place due to its natural attributes and due to the kinds of people one can find there. This idea was expressed in most of the activities which were related to the sea shore, the underwater marine life and in the variety of people who go there: Israelies and tourists, newly wedded and youngsters who want a "break", and even beach bums.

To summarize, the qualities of oral language, i.e., fragmented syntax, are different from those of written language in expository prose, where there are conjunctions to show and to "signal" (Meyer, 1975) the author's higher order

structure. In addition, the two legitimate levels of interpretation--an unedited description of a reality from an expert interviewed and/or an artistic selection of underlying themes--lend themselves to two different "content structures" (Meyer, 1975). The details of each story stay the same but the higher order macrostructures, which are so important for recall, (Meyer, 1975) would be different.

Another factor in judgement of the static story structure was the cultural aspect. Since the events of the stories do not occur in the students' native country there is a difficulty beyond knowledge of vocabulary items, and locating of contextual cues. Even though most of the events (but not all) are similar to some extent to American situations, still students who lack appropriate cultural schemata might show different patterns of recall than natives. The importance of culture to recall of stories was shown long ago by Bartlett (1932) and recently by Steffensen (1979).

Because of the cultural consideration, the stories were translated into English and the translation was done with the editorial aid of an American. Four American graduate students were instructed to read the stories with no time limitation, and at their convenience they sat with the author to describe their content structure.

The construct "content structure" (used by Meyer, 1975) is used here in a broader sense than originally used by its author. Meyer is including in this term a tree structure composed of vocabulary items actually present in the text. To my view, the Kintsch and van Dijk (1978) approach may be more appropriate to the complexity involved in discourse comprehension. Kintsch and van Dijk say that, "The semantic structure of a discourse is characterized at two levels, namely, at the level of microstructure and of macrostructure. The microstructure is the local level of the discourse, i.e., the structure of

the individual propositions and their relations. The macrostructure is of a more global nature, characterizing the discourse as a whole" (p. 365).

For the story about Jerusalem, the macrostructures described by all five raters were almost identical for the higher-order categories that subsumed all the information: People and Places. These categories were not always named the same, but the similarity was close enough. See Table (2).

Table 2. Macrostructures of Jerusalem Story

	Categories	
Rater	People	Places
B	Student Life/ Batia	Jerusalem: modern and ancient
K	People	Places
E	Batia	Jerusalem
S	Lifestyle	Physical characteristics
D	Student Life	Jerusalem: modern and ancient/ Hebrew University

The above scheme was simplified and tended to emphasize similarities. There were some differences, too: rater D saw the place category as superordinate to the people's category, while rater K saw them as equal in level of importance.

However, there was a difference between the author and the other raters in the second level categories, especially in breaking down of

students' activities around days of the week, while the American raters used different structures to categorize the events:

D: A list of activities

K: Activities on campus vs. activities off campus

S: Activities of students vs. activities of families

Signaling. Some signaling was used in the two interviews. In the Jerusalem story the theme (a city which is both old and new) was repeated twice: once close to the beginning of the interview and once as a closing statement.

In the story about Eilat more signaling was used. One way was to add an additional statement before the questions of the interviewer, for example: ANAXNU TZRIXOT LEDABER AL HA'ANASHIM SHENOS'IM LE'EILAT. MI NOSEA LE'EILAT? (We should talk about the people who go to Eilat. Who does go to Eilat?) Another way of signaling was a summary statement of a preceding large text portion: TOV AZ ANI YODA'AT: BABOKER OSIM SPORT, HOLXIM LAYAM LEHISHTAZEF O' LEHISTAKEL AL HADAGIM . (Well so I know: in the morning people do sports, go to the sea to get sunten or to look at the fish.)

Pictures. The two tapes interviews were interspersed with pictures (and sometimes also music) of places and events mentioned in the dialogues; for example when the interviewee said that students go on Saturday morning to visit the ancient part of the city, then pictures from the ancient part of the city were shown. An example from the second story could be: When the interviewee was asked what activity she did in Eilat, she said that she learned to dive into the water, and that many people are diving there to see tropical fish because the water is warm year-round. The pictures for this

were a diver and an underwater scene of corals and fish.

To summarize, the pictures were providing context, but looking at the pictures could not have recreated the entire episode.

2. Results of Exposure to the Generic Materials

Since there was no other group with whom to compare performance, the following descriptive measures were used to describe the results of the group who first used the videotapes: total length of recall protocol, paragraphing, local and global coherence markers, use of macropropositions, content accuracy, depth of recall in each microstructure, and overall organization of the recall protocol.

2.1 Story I Performance

Length. Five out of eight protocols were only half a page long. The two best students produced a three-quarter of a page protocol. Only one student produced one and a fourth pages.

Paragraphing. Five out of eight did not use paragraphs at all. Two had inconsistent marking of paragraphs. Only one student had consistent marking of paragraphs.

Coherence markers. One student tried to create a translation of the interview and to reproduce the question and answer format. Some of the questions were just her own reconstruction. This was the least coherent protocol.

The other seven protocols used expository prose style to summarize the interview (which is the efficient strategy), but they differed in their coherence. The best and worst protocols are reproduced below (see figures 2 & 3). The worst protocol includes some referential ties such as "she lived"

and "she also went to school." Unrelated nodes are tied with "there is". The best protocol is divided into four distinct paragraphs, each one dedicated to one function: (1) macropropositions about the entire interview, (2) the elements of the plot relating to Batia, (3) elements of the plot relating to the students in general, (4) general statements about the city of Jerusalem and regarding Batia's attitude.

Figure 2. Videotape: Jerusalem--M.

Her name was Batia.
She lived in Israel for 5 years.
She also went to school in Israel.
There were two campuses.
The one she went to had a cafeteria, library, and music.
There is a supermarket in the city.
There is also a disco that has pop and rock music.
The students sit and talk which is very pleasant she says.
Batia takes a bus to the city then once in the city she walks.
On Saturdays she does not study.
Esther said Thank you very much and I'll be seeing you. Batia said Good-bye and that was the end.

Figure 3. Videotape: Jerusalem--I.

Batia and Esther were talking about student life in Israel. (Esther was asking Batia questions.)

Batia goes to school at a university in Jerusalem. She was born in Tel Aviv. There are two campuses in Jerusalem and she goes to 'נחכים [guess]. She lives with other students. Her family lives somewhere else. She sees them on weekends for Sabbath dinner. They go to the supermarket to prepare for dinner.

The students study during the week and have fun on the weekends. They go to discos and dance. They also gather together to sing and talk with each other. They go to cafeterias and order cake, ice cream, and coffee. On Saturday, they travel to different places in Israel. If they are going somewhere where they cannot walk, they take the bus. Saturday at noon there are soccer games. There are 500 students at the university.

She also described Jerusalem as very pretty land, and that she likes living on campus.

Content accuracy. Even the best protocol demonstrated some mixing of facts from the two plots: The student wrote that she (Batia) sees her family on weekends, while actually the students go to a family, and Batia has only friends. There was also over-generalization: The story is about taking the bus from campus to downtown and not about always taking the bus (which is possible). Some mistakes appeared: In the tape they study 5 1/2 days in a week, but the student wrote that there are 500 students at the university.

Depth of recall in the microstructure level. Even in the best protocol,

129 E: And the disco?
130 B: There is American
131 - music there
132 you know
133 Pop
134 Rock
135 people dance
136 and also talk
137 a little bit
138 E: Is it possible to talk there?
139 to know new people?
140 B: Yes
141 you can get to know new people
142 because
143 the boys invite the girls to dance
144 but it is impossible to talk very much
145 the noise is so loud.

Figure 4. Disco Scene from the Jerusalem Interview

with an episode that is easy to interpret, because of its similarity to American life, the student wrote, "They go to discos and dance", versus 17 idea units in the interview. See figure 4.

Overall organization. Except for people who clearly paragraphed (as in the good example) overall organization was poor. One student (with the lowest vocabulary grade) wrote a long and paragraphed recall protocol but with a lot of pictures descriptions, guesses with no basis in the dialogue, and inferences. This was a clear case of minimum amount of language processing. It seems that overall organization could be an important criterion only after most of the propositions have been processed.

Macropropositions. There were very few macropropositions used. Only three students tried to write those, such as, "She told about the college and its functions", but only few of them were true.

According to Kintsch and van Dijk's (1978) text comprehension model, a schema, which is usually shared by the members of a given cultural group,

determines which micropropositions or generalizations of micropropositions are relevant, and thus which parts of the text will form its gist.

Hence, production of relevant macropropositions seems a high level performance that cannot be normally expected from students who are unfamiliar with the foreign culture and who are novices in this language as well.

2.2 Conclusion

Performance on the second story exhibited similar characteristics. It seemed as though (according to the grade in the vocabulary quiz) students were not applying their knowledge of vocabulary. It seemed as if they did not know how to study. Therefore, the study skills literature, discourse processing literature, and some work regarding metacognitive development were consulted in order to produce the interactive component, that will hopefully create conditions for better performance.

3. Theoretical Framework for the Interactive Component

Results of testing the generic materials could be interpreted by consulting Cook and Mayer's model of learning from prose. The generic materials were designed to be highly structured (not like a frivolous conversation) with the questions of the interviewer pointing to the macrostructures and the pictures illustrating and making the details more memorable. But still, even good students (1) did not account for many episodes, (2) did not pick up a lot of details, (3) overgeneralized the two lines of plot to one plot, and (4) did not see higher order interconnections. Cook and Mayer's model is pointing to three components that are critical to learning from prose: content knowledge, structure knowledge and process knowledge.

Some students had more content knowledge than others, but they did not outperform the others. It seems that even though there was structure in the generic materials, students who do not have "structure awareness" did not use the structure to facilitate their learning. The students are probably deficient in process knowledge as well.

Process knowledge, according to Cook and Mayer, relates to levels of processing hypothesis (Craik & Lockhard, 1972): The more deeply prose is processed, the better it will be remembered. In addition Cook and Mayer bring examples from newer theories, that there would be several good reading strategies, each one matching to another type of performance. For instance, Mayer (1979) has distinguished between "addition" and "assimilation" as two different encoding strategies which produce different types of performances.

It seems as though Cook and Mayer's "process knowledge" component in the model is not inclusive enough as far as knowledge available today on studying from text.

Recently there is an awareness of the relationship of metacognitive skills and reading. Baker and Brown (1984) list some of the metacognitive skills involved in reading:

> "(a) clarifying the purposes of reading, that is, understanding both the explicit and implicit task demands;
> (b) identifying the important aspects of a message;
> (c) focusing attention on the major content rather than trivia;
> (d) monitoring ongoing activities to determine whether comprehension is occurring;
> (e) engaging in self-questioning to determine whether goals are being achieved; and
> (f) taking corrective action when failures in comprehension are detected" (p. 354).

Baker and Brown (1984) report than even mature readers (college students) do not monitor their comprehension that closely. They did not find sixty-two percent of confusions which were deliberately implanted into their reading passages.

Concerning "reading for remembering" which is the task most similar to the task researched here (listening for remembering), Baker and Brown (1984) list the following five activities: "Concentrating on main ideas, making use of logical structure in the material, self-interrogation during studying, self-testing the results of studying, and employing macrorules to ensure comprehension and retention" (p. 368).

The macrorules mentioned are operations of deleting redundancy and trivia, providing superordinates, and finding or inventing topic sentences.

We can see here a host of activities that include applying previous general knowledge (how can one identify main vs. trivial other wise?), applying knowledge about the structure of the material, comprehension checking through self-interrogation, and memory checking through self-testing. Applying macrorules is again information reduction and categorization that help both in comprehension and recall.

Looking at the study skills literature revealed that some of the components were researched already and produced positive results, while some were not. Some elements were found to be most effective being presented prior to the text, while others were found to be most effective after the text.

3.1 Advance Organizers

Meyer (1981) reviewed what she calls "adjunct techniques designed to bridge text and reader variables". Advance organizers were researched a lot.

Most of the literature on advance organizers is regarding their content function. Some of the literature points to "positive results" and some to "negligible effects" (p. 26). But more recent studies show that advance organizers are helpful when the passage to be learned is poorly organized. Another type of advance organizer was recently defined--one that aims at passage structure. Thorndyke (1977) found transfer learning effects across successive stories with the same plot structure but new characters. On the other hand, Meyer et al. (reported in Meyer, 1981) tried twice to replicate Thorndyke's finding with expository prose, and the data failed to show statistically significant differences.

3.2 Post-Questions

Questions as an adjunct technique of prose comprehension have long been researched (Anderson & Biddle, 1975). Meyer (1981) summarizes the findings as follows:

> "In general, the earlier studies showed that questions facilitate comprehension of prose. Prequestions were shown to facilitate intentional learning of the cued content, but were not found to increase incidental learning. . . Post questions were found to stimulate more general learning from text, and Frase (1968b) showed that frequent interspersion of postquestions provided the most effective use of questions for overall prose comprehension" (p. 23).

Anderson and Biddle (1975) try to divert attention to the theoretical question rather than to the empirical evidence: "We do not need another demonstration that adjunct questions 'work'. Surely serious application of questioning techniques in the real world of instruction will require knowing

why they work and under what conditions" (p. 108).

Rickards and Denner (1978) reviewed the literature on "inserted questions" from the behavioristic orientation, where question position and frequency were the important variables, through the cognitive orientation where the level of inserted question is most often the manipulated variable. In their summary, Rickards and Denner generalized that post-question groups exceeded pre-question groups or reading-only groups in recall of incidental passage materials, but there were numerous exceptions to this generalization.

To summarize, the advantage that was found in many research studies has been one of incidental learning or what is called "indirect effect". This is an advantage that is important when studying from text or "reading for remembering" (as used by Baker and Brown 1984), when the intention is that the learner will comprehend and remember most of the information both high and low in the content structure. On the other hand, it seems that there is not much difficulty in cuing learners to a certain piece of information in a text ("direct effect"), and that this could be done regardless of the questions' position or level.

Rickards and Denner (1978) also summarize current views on processes that seem to be associated with post-questions:

> "(1) A specific review process which involves mental review of material directly questioned; (2) a general review process which results in mental review of nonquestioned material that is adjacent to and/or thematically related to the questioned material; (3) a learning set process in which one focuses attention on the particular type of information being questioned. This learning set develops after having been repeatedly exposed to several post-questions of the same type, and the set is

> applied to paragraphs following the adjunct post-questions; and (4) a general stimulatory process which results in increased attention to information in paragraphs immediately following the inserted post-questions" (p. 339).

These four processes were also labeled specific backward effect, general backward effect, specific forward effect and general forward effect, respectively.

Levin (1982) differentiates between strategies that are beneficial for macrostructure level of text and strategies that are beneficial for microstructure level of text. Also in each level he differentiates between strategies that primarily support comprehension and strategies that primarily support recall. His view is that success in one of the four tasks does not ensure success in others, unless proper strategies are employed in addition to strategy monitoring by the learner. Neglecting one of the levels is called by him either "top-down leap of faith" or "bottom-up leap of faith" (p. 417), depending on which level is strategically processed and which level is expected to follow up without conscious effort.

In Levin's (1982) list of memory-directed microstructure strategies one can find reviewing details and answering lower-order questions. These strategies are recommended, but he recommends more strongly mnemonic devices for remembering.

3.3 Intermediate Level Retrieval Cues

Being a successful learner from text is a late developing skill, and even college students unexperienced with a certain task do not execute the most efficient strategies. Brown et al. (1978) have studied retrieval cue selection. The researchers hypothesized that a sophisticated retrieval plan might involve the selection of relatively less central or important facts as retrieval cues, because recall of main ideas happens without conscious intent

to do so. In this study college students did not adopt this strategy in their first trial of recall but afterwards modified their retrieval plan and selected intermediate level units as aids for recall.

In general the new area of metacognition refers to "deliberate conscious control of one's own cognitive actions" (Brown, 1980, p. 453). Brown (1980) describes "automatic" reading of skilled readers where all their top-down and bottom-up skills are so fluent that they can proceed with reading quite quickly until a comprehension failure is detected, and then they must slow down and invest time and effort in conscious attempts at debugging strategies. Brown differentiates between different reading tasks such as deep processing versus skimming, but in general she says, "Any description of effective reading includes active strategies of monitoring, checking and self-testing" (p. 453).

3.4 Macrostructure Strategies

Levin (1982) is again the source for the macrostructure support feature of the interactive component. In his model that was cited several times he differentiates between comprehension-directed and memory-directed strategies for the macrolevel, too.

Only memory-directed strategies were considered important for the interactive program, since the students were considered to be lacking cultural knowledge in general, even if some of them have been to Israel and were familiar with some of the physical characteristics of the places. It was hypothesized that for this beginning level input of cultural knowledge one macro advance organizer, or any other device, would not change the students' schema in interpreting the discussions they are listening to. This kind of

change could happen only in a longer period of time, when students would be exposed to a lot of input about the culture of the target linguistic community.

Hence, as stated in Kintsch and Van Dijk (1978) the level of macrostructures in comprehension was expected to be operating, but the experimenter wanted to leave it as variable or biased as naturally would occur with information from a foreign country.

But it was important to support the memory of whatever macrostructures the students were constructing in order to evaluate as fully as possible their current state of comprehension.

Levin (1982) recommends text analysis, concretization (through graphs or visuals), summary writing, underlining main ideas or answering higher-order questions. The strategy that was used in this program was the last one in this list, as will be detailed in the following section.

3.5 Description of Interactive Component

The undergraduate students who are novices in a foreign language have presumably very low skill levels in "automatic listening", which is here hypothesized to be similar to automatic reading. Also, it was hypothesized they are on different levels in general as skilled learners: some have probably developed sophisticated study skills while others have not. Therefore the interactive component was designed as modeling a text-learning strategy which will structure the time the students are engaged in practice.

A. Chunking to component episodes. The recall protocols of the group experiencing the videotape were fragmented, and it seemed that the students were not aware of the higher-order structure of the interview. Therefore in the interactive treatment, the computer played each episode at a time to

make episode boundaries more salient.

B. Forward cues. The "forward cues" were computer screens before each episode which included content advance organizers and structural advance organizers. Both kinds were designed to be very general in nature, so as not to disclose the content of the interview and by that providing a content advantage rather than a strategy advantage to the students listening in the interactive setting.

An example of a content advance organizer could be the following from the interview about Jerusalem:

"LISTEN AND FIND OUT BATIA'S RELATIONSHIP WITH THE CITY OF JERUSALEM. ."

This was just an introduction to the topic being discussed in the folowing episode, but could not help in a recall protocol to say: Batia (the interviewee) had a relationship with the city of Jerusalem. . . Only from the videotape in Hebrew could the student pick up the fact that she was a student in the Hebrew University in Jerusalem; she lived in this city for five years; she was actually born in Tel-Aviv, but as an unmarried student had a good time in this city.

An example of a content advance organizer from the second interview could be:

"THIS PLACE IS FOR ISRAELIES--LIKE ???? FOR AMERICANS"

This was a very implicit advance organizer, intended to have students activate their "knowledge of the world" from life in America before listening to a segment describing why people go to Eilat (a resort city).

Structural advance organizers are not always exclusively different from the content advance oganizers, but in general they were hints to episode interrelationships. An example from the story about Jerusalem was an advance organizer appearing after the episode of the Friday night family meal:

AFTERWARDS THERE ARE TWO CHOICES. THE FIRST ONE. . ."

and before the following episode the advance organizer was

"AND THE SECOND CHOICE. . . "

Again, only from the tape in Hebrew could the students learn that the time frame is Friday, and first comes a family meal and then come two entertainment choices for the students; one is a "singing-night" and one is a disco.

C. Backward cues. The cues referring back to each episode were intended for self-monitoring and for review that would enrich the learning from the episode. It was hypothesized that even the best students will just pick up the gist in first listening, and they will need a review to pick up more. On the selection process in encoding see Meyer (1975). On the other hand, lower skill students will use the backward cues for self-monitoring.

Backward cues were divided into two kinds: post-questions that appeared on screens, always labeled "THINK" and suggestions for intermediate level retrieval cues that always appeared on screens labeled "REMEMBER". No feedback was provided in this treatment. The modeled strategy was to provide some hints for students who had learned vocabulary but had not practiced comprehension in a second language. The hints were intended to encourage the learners to invest time and effort in search activities until they find a coherent interpretation to the discussion they are listening to. The notion was that the best solution would be to have them trained to rely on their own resources rather than providing an easy way out.

Since the treatment was based on relying on one's own resources with the same hints for all learners, it was hypothesized that the treatment would benefit all the students, but people with a larger Hebrew vocabulary base and maybe people with better study strategies (good students in general) could

profit more, since they have a larger resource base to begin with. An example of a THINK computer page could be:

********THINK********

THE PLACE WAS REALLY TWO PLACES.

W-H-A-T ARE THEY?

W-H-E-R-E ARE THEY?

TO WHICH ONE WAS BATIA RELATED?

CAN YOU LIST SOME OF THE THINGS THERE?

IF YOU ARE NOT SURE--GO AHEAD AND LISTEN AGAIN. . .

Again the content listing was very limited if one does not understand the language. One only gets an idea that they talk about two places, and that to one of them Batia (the interviewee) was related. But this information could be reassuring to one who just understood that the discussion was about the two campuses of the Hebrew University in Jerusalem, one in the new part of the city, the western part, and one in the old part of the city, the eastern part near the Ancient City. Batia studied on the western campus and she lived in a student dorm. Then she goes on describing what there is on the campus: big buildings, several cafeterias, a very big library and a museum. Even if one comprehended the general idea, still three or four questions of a discussion of 0.44 minutes (average length of episode) would presumably urge even a good student to go back to the previous episode and to pick up answers to the questions he could not answer after first listening.

An example of a REMEMBER could be:

********REMEMBER********

T-W-O PLACES

BATIA WAS RELATED TO O-N-E OF THEM.

THERE ARE SOME FAMILIAR THINGS THERE.

The local intermediate level retrieval cues (the REMEMBER) could point to importance level within the details of the conversation, but also suggested to the student to encode this information (by rehearsing or taking notes) and not "drop" it, since students were aware that at the end of listening they are supposed to write a detailed recall protocol.

D. Several suggestions for macrostructures. In a pilot study that has been conducted before with natives, it was observed that they did not use the same organization plan in their recall protocols, which was confirmed by their self-reports of memory strategy. Therefore, several suggestions of macroorganization were suggested to the students at the end of the program under the title REVIEW.

Kintsch and Van Dijk (1978) in their model of text comprehension and production theorize a text base which is a "linear or hierarchical sequence of propositions in which coreferential expressions occur" (p. 365). Another level which is necessary in discourse comprehension is the macrostructures which are derived by applying macrorules that "both reduce and organize the more detailed information of the microstructure of the text" (p. 366). Kintsch and Van Dijk point to world knowledge and schematic structure of discourse as needed to establish connection and coherence at the microstructural level and also for application of macrorules.

The assumption was that if the students by the end of the program established one or more macrostructures, then the review would be just reassuring. But for less skilled learners the review page might help them to see inner connections which are assumed to contribute to both comprehension and recall. This phenomenon was called "organizational plan" by Meyer and Rice (1983) when they studied how certain texts are more likely to be recalled with the same organizational plan (top-level structure) while others

are more likely to be recalled with other organizational plans.

An example could be from the interview about Jerusalem:

********REVIEW********

ORGANIZE YOUR THOUGHTS ACCORDING TO ONE OR MORE OF THE FOLLOWING IDEAS;

(1)--TIME--WHAT DO THE STUDENTS DO ON DIFFERENT DAYS OF THE WEEK?

(2)--PLACE--THE DIFFERENT SECTIONS OF THE CITY AND WHAT IS DONE THERE.

(3)--PEOPLE--WITH WHOM DO STUDENTS INTERACT AND WHEN?

(4)--QUALITIES OF THE CITY--HOW ARE THE TWO QUALITIES CHARACTERISTIC OF PEOPLE, PLACES, AND EVENTS?

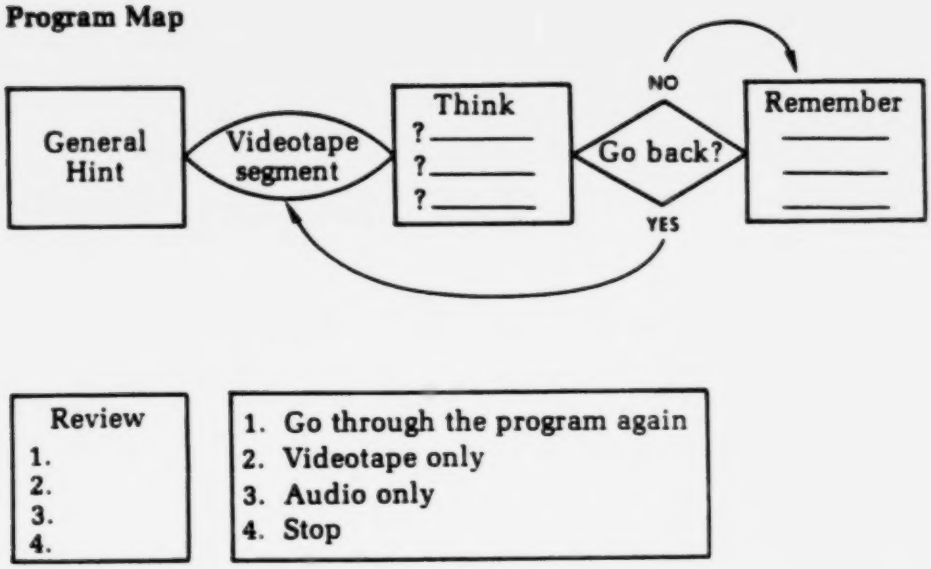
(5)--BATIA--WHAT EVENTS REALLY HAPPENED TO HER?

E. Program's conceptual map. Cambre (1984) has reviewed research which defines computer anxiety, measures it, and looks at its correlates. One point mentioned by Cambre (1984) is the following: "An anxiety reaction to stress can occur as a result of uncertainty associated with external or environmental factors as well as internal or cognitive factors" (p. 4).

The interactive program is not reviewable as many other computer programs. Hence it was hypothesized that it could be a source of anxiety to some students and therefore would not help them in the listening practice.

Consequently, a fifth variable in the interactive treatment was conceptualized. A map of the basic pattern of the program was drawn and explained to the students twice before sitting down to work (see figure 5). It was emphasized orally to them that the main experience is the videotape in Hebrew, while the computer programs would provide some pre- and post-cues to make the listening easier.

Figure 5. Program Map



Summary of the Interactive Component

After two screens of instructions the program began with the following repetitive pattern: a screen with an advance organizer, a videotaped episode played, a screen with a list of post-questions (THINK), a choice point screen (GO BACK? Y/N), then a student could choose to go back to the last videotaped episode (no limit of how many times) or to advance to the retrieval cue page (REMEMBER). This pattern repeated itself with each episode. At this stage in the program a list of macrostructures appeared (REVIEW).

The last component was a choice point which provided four options: to watch the videotape without computer guidance, to listen to the taped discussion with neither visuals nor computer guidance, to go through the structured program again or to quit. These choices were not hypothesized to make much of a difference, since the initial encoding of the story has been done already.

The initial encoding was designed to create as large a text base as possible to ensure meaningful practice at the decoding level. Cook and Mayer (1983) provide a framework for assessing learning outcomes as a result of reading: (1) Number and type of nodes; (2) internal connections; (3) external connections. In order to achieve a good listening comprehension practice at the level of novices, the first two criteria were considered to be important. A skeletal text base with a lot of "external connections" to other bodies of knowledge would not be fruitful at that level, because gaining a lot of practice requires decoding of every expression in the second language.

III. METHODS

1.1 Materials

As described above the two videotaped interviews in Hebrew were the generic materials. One was named, "Batia is Telling about Student Life in Jerusalem" ("Jerusalem" for short), and the other was named, "Batia is Telling about Eilat" ("Eilat" for short). The Jerusalem story was 523 words long, out of which nine percent were words not included in the Hebrew textbook glossary. The Eilat story was 640 words long with eleven percent being words not included in the Hebrew textbook glossary.

The interactive programs were written using the BCD authoring system for interactive videotape. In the interactive mode students listened to each interview, cut into component episodes: Before each episode appeared an Advance Organizer, then the videotape played the episode, then Post-Questions (THINK page) appeared on the screen, then a question appeared (go back yes/no), and if the student chose not to go back the next screen would be a few summary statements about the episode that were hypothesized to be good Retrieval Cues (REMEMBER page). This pattern repeated itself until the end of the program, where a list of suggestions for Macrostructures was presented (REVIEW). At the end of this linear sequence there was a choice point, where students could choose to go through the program again, to watch the videotape without computer interruptions, to listen to the interview with no visuals, or to quit (see program map in figure # 5).

1.2 Subjects

Students were enrolled in a Hebrew 102 course at The Ohio State University. They came to the computer laboratory to fulfill a course

requirement. Hebrew 102 is usually offered in one section per quarter with an enrollment range of five to fifteen students.

When the videotapes were ready the entire Hebrew 102 course of winter, 1985 (eight students) came to the computer laboratory and listened to the Jerusalem story on the eighth week of the quarter and again on the ninth week of the quarter to the Eilat story.

When the interactive programs were ready the entire Hebrew 102 course of spring, 1985 (nine students) came to the computer laboratory and listened to the same stories in the same order in interactive modes, also in the eighth and ninth weeks respectively.

1.3 Setting

Each student could use the equipment for about an hour. The setup included an Apple II plus microcomputer, a half-inch videotape player, a monitor to display the videotaped program, and a "green screen" to display the computer messages.

When students were using the programs just in videotape mode, they were sitting in front of the same equipment, but only the videotape and one monitor were operating. When students were using the programs in interactive mode, the four equipment components were operating.

The student used the computer laboratory on regular operating hours, when students from other courses were using the laboratory including the printers.

1.4 Data Sources

Each student listened for about an hour to one interview, which had a net playing time of about eight minutes. Students were encouraged to take notes.

After they stopped listening they studied their notes for a few minutes and then wrote a recall protocol in English. They were instructed to write as much as they could remember. When each one stopped writing, the experimenter showed him/her a list of visuals that were used in the program, and then they could add some more on a separate page. A week later the same process repeated itself for the second interview.

After the treatment was over, every student was interviewed for fifteen to thirty minutes. Each interview was semi-structured and was intended to assess the learner's preferred treatment and his/her perception and awareness of the comprehension and recall processes which he/she experienced.

A surprise quiz was administered to assess the students' knowledge of Hebrew vocabulary. Students also reported their university grade point averages.

1.5 Procedures

Variability has been observed in the organization and labeling of the macrostructures among the author of the scripts and the American raters (see section 1.5 in Chapter II). In addition, novice second language learners are used to translation, which channels attention to text micropropositions. Therefore, the following analysis procedures have been developed. For each story an instrument was developed, which included a listing of all idea units narrowly defined (see figure 4). Also, a form was developed for each story (see figure 6) where component episodes were listed on the left. The division to component episodes was identical to the one which was used to chunk the stories for the interactive treatment.

The experimenter used two types of analyses on the 34 recall protocols.

The first one was a count of the number of episodes mentioned in each protocol. Certain criteria were set for positive judgement. If an episode was mentioned and also satisfied the criteria, a plus score was inserted in the corresponding box; if details from the episode were mentioned, but the criteria were not satisfied, a minus score was inserted, and if the episode was not mentioned at all, a zero score was inserted. (For a similar procedure see Kintsch & Greene, 1978.)

The second analysis was to count the number of nodes that were mentioned in each protocol. The instruments of idea units were used, and each node/detail that matched the listing in the instrument received one point. (For such a procedure see Bernhardt, 1983).

Therefore, the summary box for each student performance consisted of two numbers: One was the count of plus scores, which is the number of episodes recalled, and a second (circled) count of the number of nodes (details) recalled. (See vertical summary box in Figure 6).

In addition, each group's mean and standard deviation performance was computed separately for each episode. (See horizontal summary boxes in Figure 6).

Students performance on the two measures (number of episodes and number of nodes) was plotted on graphs versus their individual position on two scales: their grade in the Hebrew vocabulary test and their grade point average score. In several cases t tests were run to compare the two groups' performance.

A doctoral student of linguistics came in as a rater to judge the scores on the tabulations sheets. He randomly sampled 20% of each group of students. The agreement between his and the experimenter's judgements regarding episodes (+, -, or 0) was calculated using a Spearman rho

Figure 6.

Episode	Gn	Li				Ia	Ti			$\bar{x}$	s.d.	$\bar{x}$	s.d.
E	②③+ ⑤1+					0	③③+			3.44	2.30	1	2.07
F	⑤②+ ⑤2+	0				0	④+			4	2.50	2.50	2
G	⑤+ ⑦+	②−				①+	③+			4	1.22	2.63	1.51
	⑥④14 ⑦④14	③⑤9				②⑥9	④④11						

correlation coefficient, which was r_s = .77.

Regarding the number of nodes, the rater was consistently higher in judgement than the experimenter. Regarding the video treatment, the mean of his judgements was higher in 26.38%, and regarding the interactive treatment the mean of his judgements was higher in 15.35%.

The recorded interviews were transcribed and their analysis will be presented ahead.

IV. RESULTS

1.1 Quantitative Analysis

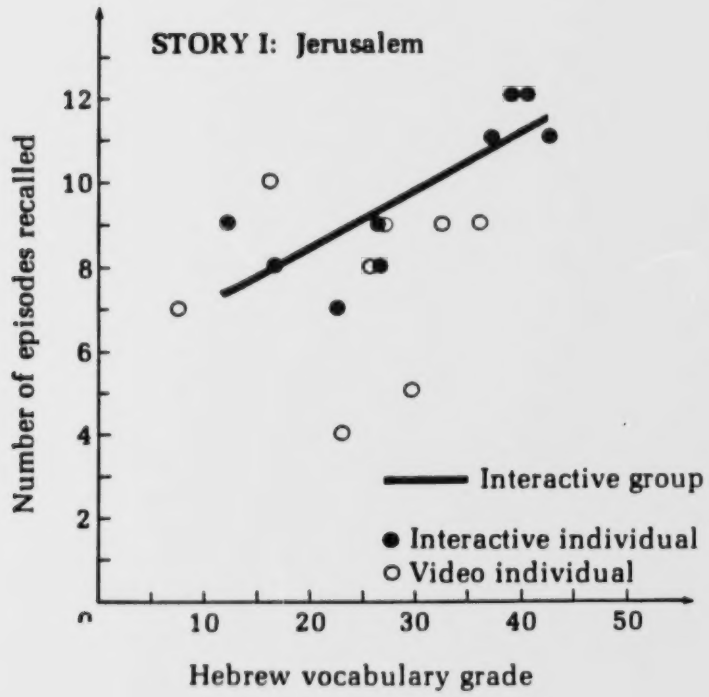
When plotting students' Hebrew vocabulary grade on the abscissa and the number of episodes recalled on the ordinate (figures 7 & 8), there was little if any positive correlation with the video treatment. In story I, r = 0.0925 and in story II, r = 0.1723. But there was a high positive correlation between Hebrew vocabulary knowledge and the interactive treatment (r = 0.8107) in story I and moderate positive correlation in story II (r = 0.5377).

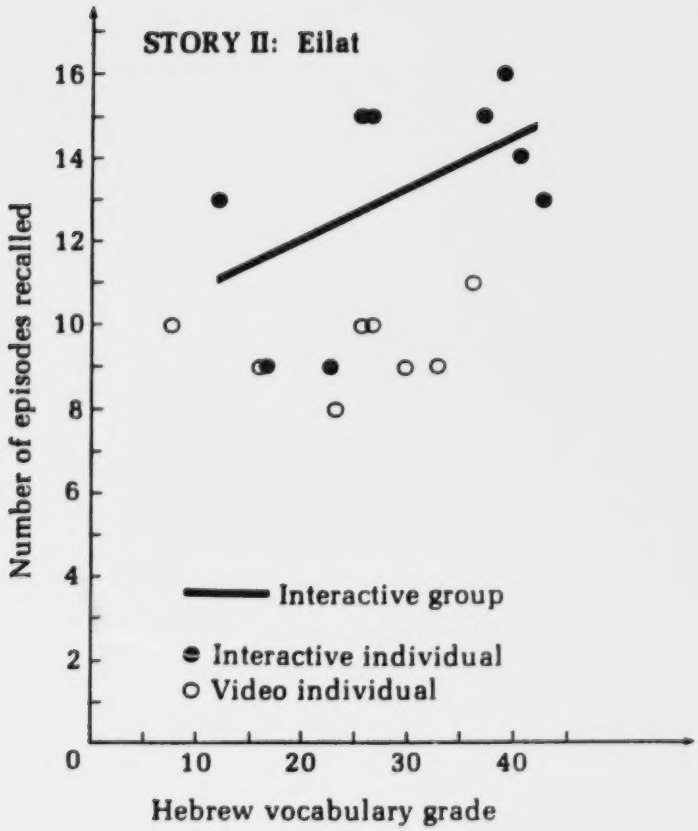
When plotting student Hebrew vocabulary knowledge versus the number of nodes recalled (figures 9 & 10), there was low positive correlation in story I (r = 0.2968) and little if any correlation in story II (r = 0.1882) in the video treatment. With the interactive treatment there was a high positive correlation for both stories (r = 0.7629 and r = 0.7657).

The students' reported grade point averages were also plotted versus the number of episodes recalled (figures 11 & 12). In story I with the video treatment a moderate positive correlation was observed (r = 0.62) and in story II a high positive correlation was observed (r = 0.80). With the interactive treatment in story I, little if any correlation has been observed (r = 0.15) and in story II high positive correlation has been observed (r = 0.86). In story II, where high positive correlation was observed in both treatments, there was a steeper slope ($slope_{iv}$ = 3.08; $slope_{v}$ = 1.74).

Grade point averages were also plotted versus number of nodes recalled (figure13 & 14). In the video treatment in story I, a very high positive correlation was observed (r = 0.90) and in story II, a high positive correlation (r = 0.77). With the interactive treatment low and moderate positive correlations have been observed (r = 0.45; r = 0.65).

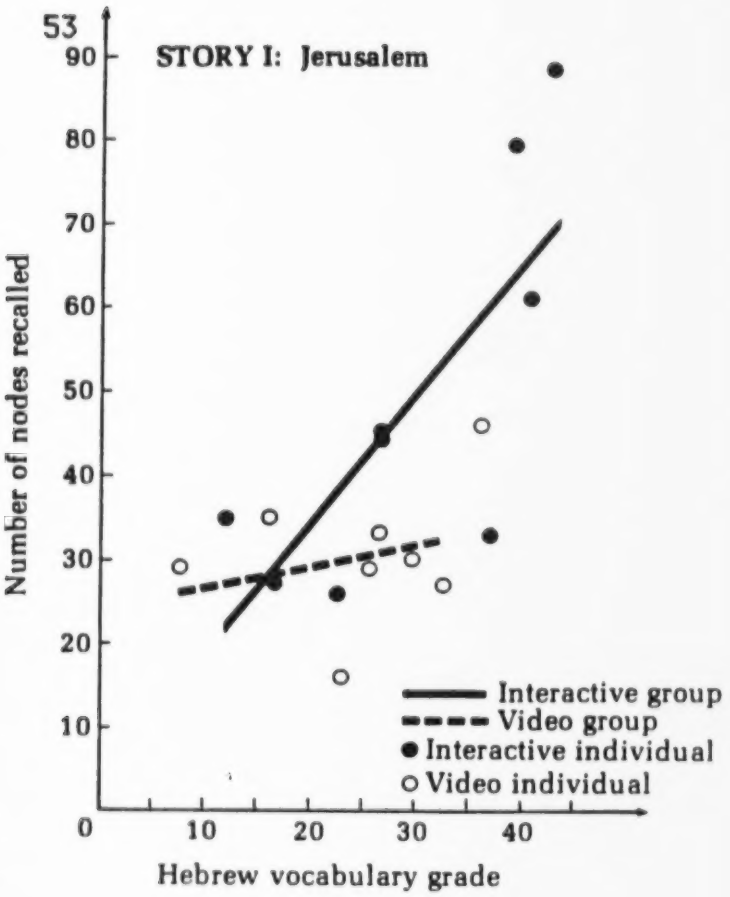
Figure 7. --->

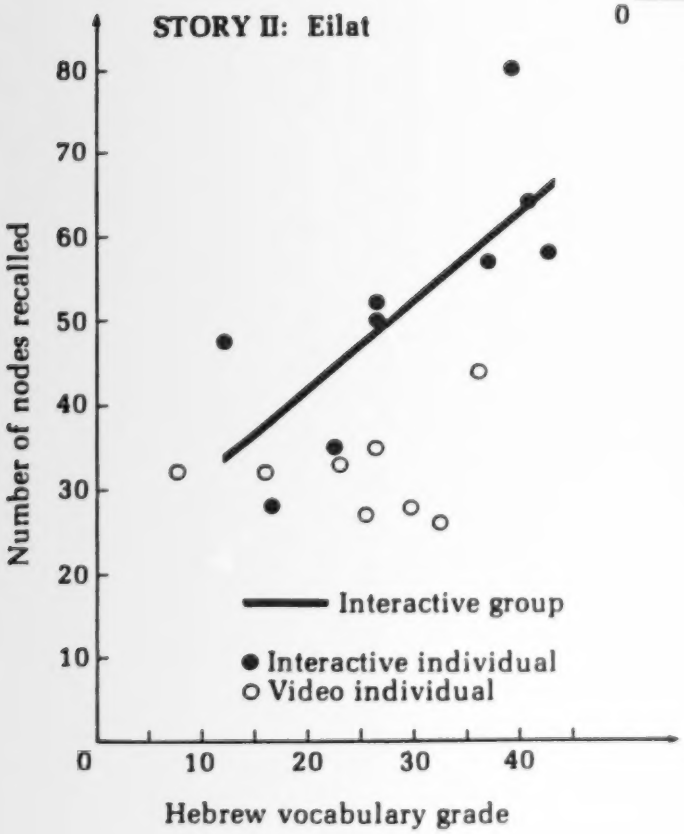




<--- Figure 8

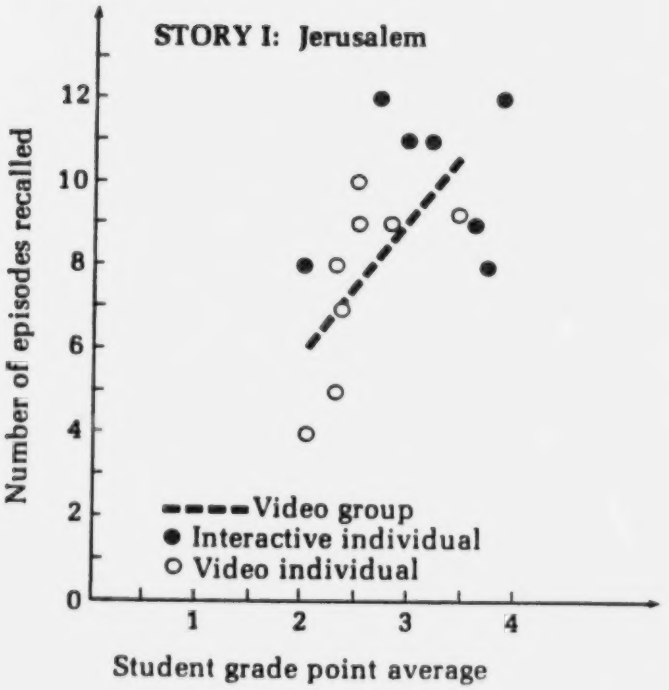
Figure 9. --->

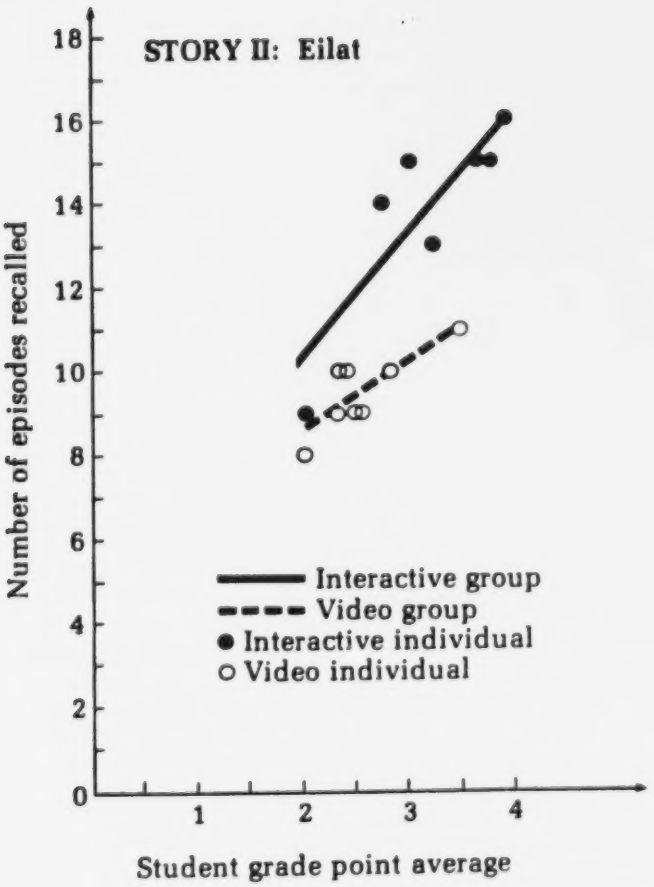




<--- Figure 10.

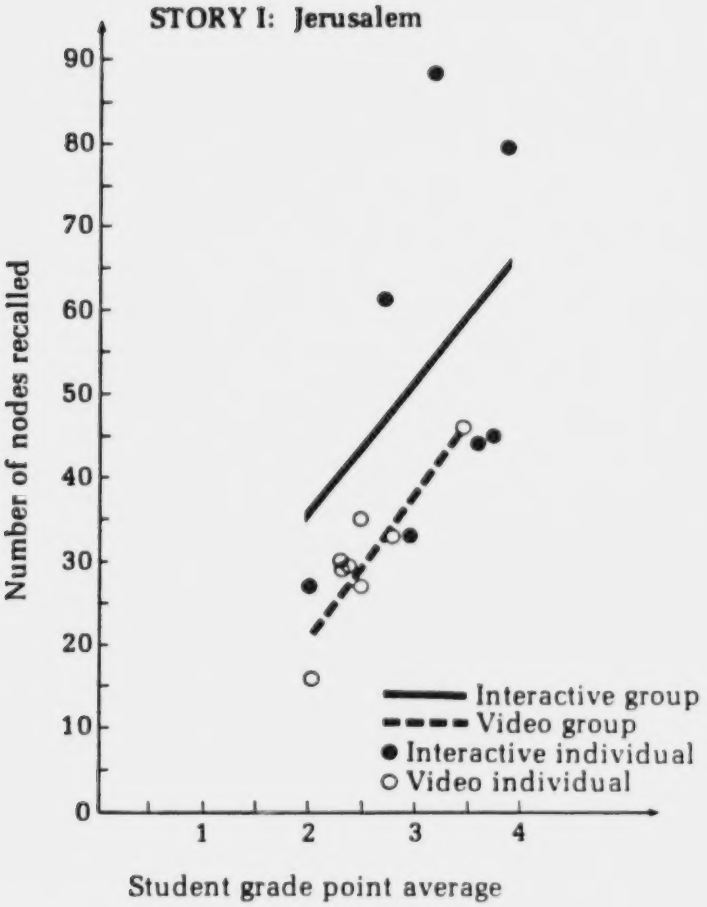
Figure 11. --->

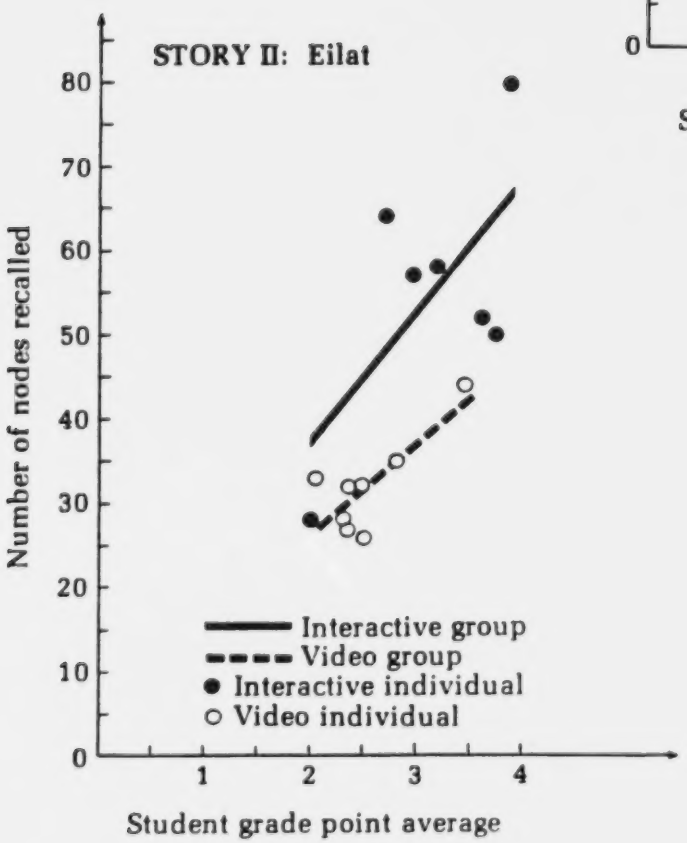




<--- Figure 12.

Figure 13. --->





<--- Figure 14.

The average performance in the two measures were compared between the two groups as shown in Table #3

Table 3. Comparisons Between Mean Performances

	Means	Standard Deviations	t Statistic
Jerusalem-episodes	3.67 7.63	1.87 2.13	2.102*
Jerusalem-nodes	48.67 30.63	22.56 8.40	2.128**
Eilat-episodes	13.22 9.5	2.59 0.93	3.843**
Eilat-nodes	52.33 32.13	15.34 5.74	3.503**

*$p < 0.1$
**$p < 0.01$

The better performance of the interactive group was consistent across most of the episodes, and not due to any peak in a few cases, as shown in Table 4 and Table 5, which is the "horizontal count" of means and standard deviations per each episode separately.

TABLE 4.

Jerusalem Episodes		Jerusalem Nodes			
$Mean_{jv}$	$Mean_{v}$	$Mean_{jv}$	$S.D._{jv}$	$Mean_{v}$	$S.D._{v}$
1	0.5	4.56	1.13	4.25	2.12
0.44	0.38	1.22	1.2	0.38	0.52
0.78	0.75	3.78	2.05	3.63	2.56
0.56	0.5	1.56	2.46	1.13	1.36
0.44	0	2.89	3.62	1	1.07
0.89	0.75	4	2	2.25	1.16
1	0.88	5	2.74	3.25	1.70
1	1	5.67	2.5	3.25	1.39
0.67	0.88	8.89	4.76	6.13	3.09
0.89	0.75	4.78	4.06	3.25	1.83
0.22	0	0.89	1.45	0	
1	0.63	3.33	2.29	0.88	0.83
0.78	0.38	1.78	1.56	0.63	0.92

Table 5.

Eilat Episodes		Eilat Nodes			
$Mean_{iv}$	$Mean_{v}$	$Mean_{iv}$	$S.D._{iv}$	$Mean_{v}$	$S.D._{v}$
0.33	0.25	0.44	0.73	0.63	0.92
0.56	0	0.44	0.53	0	0
1	0.88	5.44	0.88	4.88	2.1
0.89	0.5	3.44	2.30	1	2.07
0.89	0.75	4	2.50	2.5	2
0.89	1	4	1.22	2.63	1.51
0.78	0.75	3.44	2.70	2.38	1.60
0.78	0.63	2.78	2.05	1.63	1.51
0.89	0.75	3.56	1.67	2.38	2.07
0.78	0.75	2.33	1.41	1.25	1.04
0.89	0.63	4.67	1.73	2.25	1.91
0.78	0.25	1.89	1.27	0.75	0.89
1	0.75	2.44	1.01	1.75	1.16
1	1	3.33	1.32	2.5	0.93
0.56	0.13	1.78	1.48	0.25	0.71
0.78	0.38	6.11	3.1	2.75	1.83
0.44	0.38	2	1.14	1.25	1.28
0.11	0	0.44	1.01	0	0

1.2 Qualitative Analysis

In order to reduce the data of the transcribed interviews, the experimenter tallied the answers regarding the following categories: elements promoting comprehension as initiated by the students (Table 6), elements promoting comprehension as initiated by the experimenter (but confirmed by the students) (Table 7), elements promoting recall as initiated by the students (Table 8), the strategy they used in dealing with the programs (Table 9), the learner control issue (Table 10), the medium they preferred for listening (Table 11), the information value of the programs (Table 12), and their overall attitude (Table 13).

Table 6. Student Initiated Elements for Comprehension

Element	Number in Videotape Group	Number in Interactive Group
Words	7	5
Pictures	6	8
Computer Hints	0	1
THINK pages	0	1
Expectation	1	1
Gestures/Facial Expressions	2	2
Lip Reading	0	2
Context	1	1
Prior Ideas from Class	1	0
Transforming the Words to a Different Form	1	1

Table 7. Experimenter Initiated Elements for Comprehension

Element	Number in Videotape Group	Number in Interactive Group
Structure	3, (1 ?)	6, (1 ?)
THINK pages	0	4
REMEMBER pages	0	1
REVIEW pages	0	1, (2 ?)
Gestures	1	1, (1 ?)
Pictures		
Advance Organizers	0	2, (1 ?)
Computer	0	1
Intonation	2	0

Table 8. Student Initiated Elements for Recall

Element	Number in Videotape Group	Number in Interactive Group
Pictures	6	9
Structure	4	2
Sequence	3	1
Computer Heading	0	2
Story Development	0	1
Association with Past Experiences	0	1
Hear the Words	2	1
Prior Ideas	1	0

Table 9. Strategy

Interactive Group

**Each episode more than one time in most cases:	9
**Quitting after the program was over:	5
**Choosing video after the program:	3
**Choosing audio after the program:	1

Videotape Group

**Skimming the tape the first time:	7
**Rewinding big segments:	8
**Changing strategies from one story to the other:	3

Table 10. Learner Control Issue

Learner Control Preferred:	Videotape group:	8
	Interactive group:	4
Program Control Preferred:	Videotape group:	0
	Interactive group:	5

Table 11. Preferred Medium

Preferred Medium	Number in Videotape Group	Number in Interactive Group
Video	4	1
Computer	5	4
Audio	0	1

Table 12. Informational Value

Value	Number in Videotape Group	Number in Interactive Group
Informational "for me"	6	6
Informational "for other students"	1	3
No Value	1	0

Table 13. Attitude

**Liked:	17
**Disliked:	0

2. Discussion

The relationship between the videotape treatment and the Hebrew vocabulary grade is important to note. In both stories and in both performance measures there was low if any correlation. In spite of the fact that the videotape treatment was well designed, students who are novices in the language but who have a relatively big vocabulary could not apply their vocabulary knowledge for comprehension any better than their classmates who have much less vocabulary.

But students who used the interactive programs and had a larger vocabulary than classmates could outperform them (see figures 7, 8, 9, 10).

The relationship between grade point averages and performance on the videotape treatment revealed a different picture: moderate or high to very high correlations have been observed. Probably students who possess good study skills could better perform the two listening tasks than their classmates.

However, the relationship between grade point averages and performance on the interactive treatment was unclear and low in story I in both measures, and moderate to high in story II. In story II there were more new vocabulary items that might have been unknown to the students. It seems as though the strategy modeled for the students was adopted and compensated for low study skills.

In general, the students working with the interactive videotape outperformed, in both stories and on two measurements, the students working with videotape. The tests of significance are however not generalizable, since there was no random assignment to groups.

From the interview data (see Table 9), we learn that the group using the interactive mode really used the intended "read-reread" strategy (in this case

listen-relisten) in order to process as much linguistic input as possible. In contrast, the group using the videotape lowered task demands by rewinding big segments of the tape, and therefore processing of every detail in a foreign language became impossible. Some were wasting time looking for an efficient strategy.

From the interview data (Table 6 & 7) we learn that the students were still in a low level decoding stage trying to construct the meaning of every proposition from a combination of word and picture recognition. The obvious structure of the story helps them make sense of larger units of meaning, but the structure was more noticeable by people who worked with the interactive program.

In the low level decoding stage no one trend is found, but a variety of strategies were used: Some looked at gestures and facial expressions; some tried lip reading; some sounded out words to themselves or wrote them down to recognize them.

The computer part was not greatly appreciated by the students as a contributer to comprehension. From all computer elements the post-questions (THINK pages) were most appreciated by the students in helping them to focus on certain points and narrow down the amount of information.

It seems that this attitude can be explained by the fact that computer hints were (as planned) not explicit enough to provide the answers to the students. They had to listen many times to each segment to figure out the meaning. It seems that the computer part was making the task more manageable for this level of students, but on the other hand constant comprehension monitoring was good up to a point. Students, who needed more review than twice every segment, chose not to repeat the program (because of the frustration of hints that could not have been actualized) and therefore

transferred to videotape mode.

The question of learner control is especially intriguing in this case. This question was not a planned part of the interview. But the students in both groups dealt with it: 12 out of 17. When discussing with the videotape group an option of a computer program to guide their listening, some rejected the idea totally, and some agreed to the need to have some hints and checking of comprehension hypotheses (top-down processes) but refused in theory to let the computer rewind their tape. The group that experienced the partial program control of the interactive mode were divided in opinion. Some liked it and some complained about the idea of "having no choice", about the length of the segments ("they should be equal") and about the particular technical setup that was used: "Annoying was hitting the keys all the time. . .it would take forever."

With such a small set of data, not much can be generalized. But the general direction of improved performance of those who learned vocabulary, with no improvement or only slight improvement of students who did not learn their vocabulary, suggests that the interactive treatment taps an important process element in comprehension without being a "give-away" to students who do not have the prerequisite knowledge for that treatment.

It looks as though Salomon's (1979) concepts of short-circuiting, supplantation and activation are applicable here. The videotape treatments probably activate existing comprehension skills and therefore are treatments that favor the skilled learner and they could probably be good for higher level learners. However, if these two samples are representative of the undergraduate novice second language learners, then skill supplantation was beneficial for them; the interactive programs were planned to model an efficient strategy. The programs intentionally did not include a feedback

element, because providing answers ("short-circuiting") does not ensure practicing comprehension skills.

The two treatments will be used in an experimental design to produce more generalizable conclusions.

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